Full wwPDB X-ray Structure Validation Report ⓘ

Jun 11, 2024 – 06:52 PM EDT

PDB ID	:	1HCR
Title	:	HIN RECOMBINASE BOUND TO DNA: THE ORIGIN OF SPECIFICITY IN MAJOR AND MINOR GROOVE INTERACTIONS
Authors	:	Feng, J.-A.; Johnson, R.C.; Dickerson, R.E.
Deposited on	:	1993-12-17
Resolution	:	2.30 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references ⓘ) were used in the production of this report:

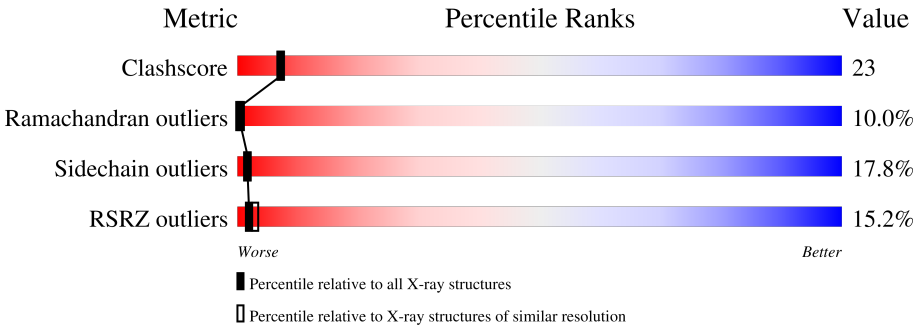
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.20.1
EDS	:	2.36.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	B	14	14% 79% 7%
2	C	13	46% 54%
3	A	52	23% 37% 42% 15% 6%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 989 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a DNA chain called DNA (5'-D(*TP*GP*TP*TP*TP*TP*TP*GP*AP*TP*AP*AP*GP*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	B	14	287	140	49	85	13	0	0	0

- Molecule 2 is a DNA chain called DNA (5'-D(*TP*CP*TP*TP*AP*TP*CP*AP*AP*AP*AP*AP*C)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	C	13	260	127	47	74	12	0	0	0

- Molecule 3 is a protein called PROTEIN (HIN RECOMBINASE).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	A	52	426	269	84	72	1	0	0	0

- Molecule 4 is water.

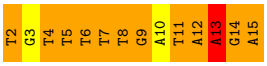
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
4	B	7	7	7	0	0
4	C	7	7	7	0	0
4	A	2	2	2	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: DNA (5'-D(*TP*GP*TP*TP*TP*TP*TP*GP*AP*TP*AP*AP*GP*A)-3')

Chain B:



• Molecule 2: DNA (5'-D(*TP*CP*TP*TP*AP*TP*CP*AP*AP*AP*AP*AP*C)-3')

Chain C:

• Molecule 3: PROTEIN (HIN RECOMBINASE)

Chain A:

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	84.92Å 81.37Å 44.04Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	8.00 – 2.30 58.75 – 1.90	Depositor EDS
% Data completeness (in resolution range)	(Not available) (8.00-2.30) 58.7 (58.75-1.90)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.62 (at 1.90Å)	Xtriage
Refinement program	X-PLOR	Depositor
R, R_{free}	0.228 , (Not available) 0.243 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å^2)	33.1	Xtriage
Anisotropy	0.473	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 205.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	0.008 for -k,-h,-l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	989	wwPDB-VP
Average B, all atoms (Å^2)	51.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 10.03% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality (i)

5.1 Standard geometry (i)

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	B	2.63	22/321 (6.9%)	3.61	63/495 (12.7%)
2	C	2.21	8/291 (2.7%)	3.11	48/446 (10.8%)
3	A	1.11	0/434	2.24	18/578 (3.1%)
All	All	2.00	30/1046 (2.9%)	3.00	129/1519 (8.5%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1
3	A	0	1
All	All	0	2

All (30) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	2	DT	C5-C7	8.08	1.54	1.50
1	B	12	DA	C4'-C3'	-7.63	1.45	1.52
1	B	12	DA	C5-C6	-7.24	1.34	1.41
1	B	2	DT	C5'-C4'	7.08	1.59	1.51
2	C	19	DT	N3-C4	-7.01	1.33	1.38
1	B	2	DT	C2-N3	-6.70	1.32	1.37
1	B	4	DT	C2'-C1'	-6.62	1.45	1.52
1	B	12	DA	C2'-C1'	-6.62	1.45	1.52
1	B	13	DA	C4'-C3'	-6.35	1.46	1.52
1	B	3	DG	O3'-P	6.30	1.68	1.61
1	B	2	DT	N1-C6	-6.29	1.33	1.38
1	B	15	DA	N9-C4	-6.29	1.34	1.37
2	C	22	DT	C5'-C4'	-6.07	1.44	1.51
1	B	9	DG	N9-C8	-5.95	1.33	1.37
1	B	13	DA	C2'-C1'	-5.75	1.46	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	15	DA	C5'-C4'	5.71	1.57	1.51
2	C	28	DA	C2'-C1'	-5.68	1.46	1.52
1	B	15	DA	C5-C6	-5.53	1.36	1.41
2	C	29	DC	C4'-O4'	-5.52	1.39	1.45
1	B	12	DA	N9-C4	-5.50	1.34	1.37
1	B	2	DT	C4'-C3'	5.38	1.58	1.53
2	C	17	DT	N1-C6	-5.28	1.34	1.38
1	B	10	DA	C1'-N9	-5.27	1.39	1.47
1	B	9	DG	C5-C4	-5.27	1.34	1.38
1	B	8	DT	O3'-P	-5.24	1.54	1.61
2	C	20	DT	C2'-C1'	-5.20	1.47	1.52
2	C	17	DT	N3-C4	-5.17	1.34	1.38
2	C	26	DA	C4'-C3'	-5.14	1.47	1.52
1	B	9	DG	C2'-C1'	-5.06	1.47	1.52
1	B	7	DT	N3-C4	-5.05	1.34	1.38

All (129) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	3	DG	O4'-C1'-N9	19.80	121.86	108.00
1	B	2	DT	N3-C2-O2	-13.68	114.09	122.30
1	B	2	DT	O4'-C1'-N1	13.24	117.27	108.00
1	B	2	DT	C1'-O4'-C4'	-12.80	97.30	110.10
1	B	15	DA	C1'-O4'-C4'	-12.72	97.38	110.10
1	B	15	DA	O4'-C4'-C3'	-12.26	98.64	106.00
1	B	11	DT	O4'-C1'-C2'	-11.76	96.49	105.90
1	B	2	DT	C6-C5-C7	-11.32	116.11	122.90
3	A	140	ARG	NE-CZ-NH2	-11.19	114.71	120.30
2	C	28	DA	C4'-C3'-C2'	-10.92	93.27	103.10
1	B	5	DT	O4'-C4'-C3'	-10.62	99.63	106.00
2	C	23	DC	O4'-C1'-N1	-10.60	100.58	108.00
1	B	6	DT	O4'-C1'-C2'	-10.31	97.65	105.90
3	A	140	ARG	NE-CZ-NH1	10.29	125.45	120.30
2	C	29	DC	P-O5'-C5'	10.08	137.03	120.90
2	C	17	DT	O4'-C1'-C2'	-9.96	97.93	105.90
2	C	28	DA	O4'-C4'-C3'	-9.73	100.16	106.00
1	B	4	DT	N3-C2-O2	-9.68	116.49	122.30
2	C	26	DA	O4'-C1'-C2'	-9.55	98.26	105.90
1	B	3	DG	P-O3'-C3'	9.54	131.15	119.70
1	B	2	DT	P-O3'-C3'	9.51	131.11	119.70
1	B	7	DT	C4'-C3'-C2'	-9.42	94.62	103.10
1	B	7	DT	C1'-O4'-C4'	-9.25	100.85	110.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	29	DC	C1'-O4'-C4'	-9.23	100.87	110.10
2	C	28	DA	C1'-O4'-C4'	-9.16	100.94	110.10
3	A	162	ARG	NE-CZ-NH2	-9.15	115.72	120.30
2	C	20	DT	C4-C5-C7	-9.11	113.53	119.00
2	C	17	DT	N3-C2-O2	-9.10	116.84	122.30
2	C	20	DT	P-O3'-C3'	8.90	130.39	119.70
2	C	19	DT	O4'-C1'-N1	-8.83	101.82	108.00
1	B	4	DT	O4'-C1'-N1	8.78	114.15	108.00
1	B	15	DA	N1-C6-N6	8.75	123.85	118.60
2	C	28	DA	O4'-C1'-N9	8.63	114.04	108.00
3	A	154	ARG	NE-CZ-NH2	-8.59	116.00	120.30
3	A	178	ARG	NE-CZ-NH1	8.47	124.53	120.30
1	B	11	DT	C4-C5-C6	8.35	123.01	118.00
1	B	5	DT	O4'-C1'-C2'	-8.33	99.23	105.90
2	C	22	DT	C6-C5-C7	-8.09	118.05	122.90
1	B	11	DT	N3-C2-O2	-8.07	117.45	122.30
2	C	25	DA	O4'-C1'-C2'	-8.07	99.44	105.90
2	C	24	DA	O4'-C4'-C3'	-8.07	101.16	106.00
1	B	11	DT	O4'-C4'-C3'	-8.03	101.18	106.00
1	B	13	DA	O4'-C4'-C3'	-7.98	101.21	106.00
1	B	14	DG	O4'-C1'-C2'	-7.88	99.60	105.90
2	C	20	DT	C4-C5-C6	7.86	122.71	118.00
1	B	7	DT	O4'-C4'-C3'	-7.84	101.30	106.00
3	A	184	SER	N-CA-C	7.83	132.16	111.00
1	B	4	DT	C4-C5-C6	7.83	122.70	118.00
1	B	2	DT	C4-C5-C7	7.80	123.68	119.00
2	C	21	DA	O4'-C1'-C2'	-7.72	99.72	105.90
1	B	2	DT	N1-C1'-C2'	7.59	127.02	112.60
2	C	20	DT	O4'-C4'-C3'	-7.42	101.53	104.50
2	C	23	DC	C1'-O4'-C4'	-7.31	102.79	110.10
1	B	3	DG	O3'-P-O5'	7.27	117.81	104.00
1	B	2	DT	N3-C4-O4	-7.26	115.55	119.90
2	C	17	DT	P-O3'-C3'	7.25	128.40	119.70
1	B	15	DA	C5-C6-N6	-7.23	117.92	123.70
2	C	21	DA	O4'-C1'-N9	7.20	113.04	108.00
2	C	27	DA	O4'-C1'-C2'	-7.17	100.17	105.90
1	B	13	DA	N1-C2-N3	7.14	132.87	129.30
2	C	22	DT	P-O5'-C5'	-7.04	109.64	120.90
2	C	26	DA	C3'-C2'-C1'	7.02	110.92	102.50
3	A	187	LYS	N-CA-C	7.00	129.91	111.00
2	C	19	DT	O3'-P-O5'	-6.96	90.78	104.00
1	B	11	DT	C6-C5-C7	-6.91	118.75	122.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	29	DC	C4'-C3'-C2'	-6.88	96.91	103.10
2	C	17	DT	C6-C5-C7	-6.79	118.82	122.90
1	B	13	DA	N9-C4-C5	6.71	108.48	105.80
1	B	8	DT	O4'-C1'-C2'	-6.70	100.54	105.90
2	C	19	DT	N3-C2-O2	-6.69	118.28	122.30
1	B	3	DG	C5'-C4'-O4'	6.66	121.96	109.30
1	B	2	DT	N1-C2-N3	6.66	118.59	114.60
3	A	154	ARG	NE-CZ-NH1	6.64	123.62	120.30
3	A	178	ARG	NE-CZ-NH2	-6.59	117.00	120.30
2	C	17	DT	C4-C5-C6	6.58	121.95	118.00
3	A	156	LEU	CA-CB-CG	6.55	130.37	115.30
1	B	12	DA	N1-C6-N6	6.55	122.53	118.60
3	A	186	LYS	N-CA-C	6.53	128.62	111.00
1	B	6	DT	C6-C5-C7	-6.37	119.08	122.90
3	A	169	PHE	N-CA-C	-6.35	93.86	111.00
1	B	13	DA	C8-N9-C4	-6.24	103.31	105.80
1	B	2	DT	C2-N3-C4	-6.23	123.46	127.20
2	C	17	DT	N1-C2-N3	6.22	118.33	114.60
2	C	19	DT	C5-C6-N1	-6.20	119.98	123.70
3	A	179	TYR	CB-CG-CD2	-6.11	117.33	121.00
2	C	17	DT	C5-C6-N1	-6.06	120.06	123.70
2	C	20	DT	C4'-C3'-C2'	-6.03	97.67	103.10
2	C	22	DT	O4'-C1'-C2'	-5.95	101.14	105.90
1	B	3	DG	C1'-O4'-C4'	-5.95	104.16	110.10
2	C	17	DT	C2-N3-C4	-5.94	123.64	127.20
1	B	2	DT	C5-C6-N1	-5.94	120.14	123.70
1	B	12	DA	C5-N7-C8	-5.94	100.93	103.90
2	C	23	DC	N1-C2-O2	5.91	122.45	118.90
1	B	8	DT	O4'-C1'-N1	-5.90	103.87	108.00
1	B	13	DA	C5'-C4'-C3'	-5.90	103.48	114.10
1	B	5	DT	C4-C5-C6	5.88	121.53	118.00
2	C	23	DC	C6-N1-C2	5.87	122.65	120.30
2	C	29	DC	O4'-C4'-C3'	-5.76	102.19	104.50
1	B	4	DT	O4'-C4'-C3'	-5.74	102.20	104.50
1	B	15	DA	P-O5'-C5'	5.70	130.02	120.90
1	B	8	DT	P-O3'-C3'	-5.69	112.87	119.70
3	A	144	ILE	CA-C-N	-5.67	104.72	117.20
1	B	7	DT	O4'-C1'-N1	5.66	111.96	108.00
2	C	19	DT	C4-C5-C6	5.64	121.38	118.00
1	B	7	DT	C5-C6-N1	-5.59	120.35	123.70
1	B	13	DA	C2-N3-C4	-5.58	107.81	110.60
3	A	148	GLU	CA-CB-CG	-5.55	101.20	113.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	27	DA	N1-C6-N6	5.49	121.89	118.60
1	B	7	DT	N3-C2-O2	-5.43	119.04	122.30
1	B	14	DG	C3'-C2'-C1'	5.42	109.01	102.50
3	A	145	ASN	CB-CG-ND2	5.41	129.68	116.70
2	C	27	DA	C5-C6-N6	-5.38	119.39	123.70
1	B	13	DA	C5'-C4'-O4'	5.35	119.47	109.30
2	C	29	DC	N3-C4-C5	-5.30	119.78	121.90
1	B	2	DT	N1-C2-O2	5.27	127.31	123.10
2	C	28	DA	N1-C6-N6	5.22	121.73	118.60
2	C	20	DT	C1'-O4'-C4'	-5.21	104.89	110.10
1	B	7	DT	C4-C5-C7	-5.20	115.88	119.00
1	B	14	DG	N7-C8-N9	5.19	115.69	113.10
1	B	11	DT	O4'-C1'-N1	5.19	111.63	108.00
1	B	2	DT	C5-C4-O4	5.17	128.52	124.90
3	A	140	ARG	CB-CG-CD	-5.17	98.15	111.60
2	C	18	DC	O4'-C1'-N1	5.14	111.60	108.00
2	C	26	DA	N1-C2-N3	5.11	131.85	129.30
2	C	18	DC	N1-C1'-C2'	5.09	122.28	112.60
1	B	11	DT	N3-C4-C5	-5.07	112.16	115.20
1	B	14	DG	C8-N9-C4	-5.06	104.37	106.40
3	A	187	LYS	CA-C-N	5.05	128.31	117.20
1	B	14	DG	C4-C5-C6	5.00	121.80	118.80

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	A	186	LYS	Peptide
1	B	13	DA	Sidechain

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	287	0	163	16	0
2	C	260	0	148	10	0
3	A	426	0	444	26	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	2	0	0	0	0
4	B	7	0	0	0	0
4	C	7	0	0	0	0
All	All	989	0	755	37	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 23.

All (37) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:13:DA:H2'	1:B:14:DG:C8	2.23	0.74
1:B:14:DG:N2	3:A:185:ILE:HG22	2.22	0.54
1:B:6:DT:O4'	3:A:139:GLY:HA3	2.08	0.54
1:B:14:DG:H4'	1:B:15:DA:OP1	2.07	0.53
3:A:188:ARG:HG3	3:A:189:MET:SD	2.48	0.53
2:C:20:DT:H2'	2:C:21:DA:C8	2.44	0.52
2:C:26:DA:H2	3:A:140:ARG:HD2	1.74	0.52
1:B:14:DG:H21	3:A:185:ILE:HG22	1.74	0.52
1:B:14:DG:H2"	1:B:15:DA:O4'	2.10	0.52
3:A:156:LEU:HA	3:A:160:HIS:HB2	1.92	0.51
1:B:12:DA:N3	3:A:188:ARG:O	2.43	0.51
1:B:11:DT:H2"	1:B:12:DA:C8	2.47	0.50
2:C:26:DA:C6	2:C:27:DA:C6	3.00	0.50
3:A:166:ALA:HB2	3:A:176:LEU:HD12	1.95	0.49
1:B:2:DT:C4	1:B:4:DT:H1'	2.48	0.49
3:A:160:HIS:HD2	3:A:164:GLN:OE1	1.94	0.49
3:A:140:ARG:HG2	3:A:141:PRO:HD2	1.96	0.48
3:A:186:LYS:O	3:A:187:LYS:HB2	2.13	0.48
3:A:160:HIS:CD2	3:A:164:GLN:OE1	2.68	0.47
1:B:9:DG:N7	3:A:178:ARG:NH2	2.62	0.47
1:B:15:DA:H2"	3:A:185:ILE:HG23	1.96	0.47
2:C:20:DT:OP1	3:A:183:SER:HA	2.15	0.47
2:C:28:DA:OP1	3:A:141:PRO:HG3	2.15	0.46
1:B:14:DG:N2	3:A:185:ILE:O	2.49	0.46
1:B:15:DA:H1'	3:A:185:ILE:HG22	1.97	0.46
1:B:8:DT:H2"	1:B:9:DG:O5'	2.16	0.46
3:A:187:LYS:HG3	3:A:188:ARG:HG2	1.98	0.45
2:C:26:DA:C2	3:A:140:ARG:HD2	2.52	0.45
3:A:160:HIS:HA	3:A:161:PRO:HD2	1.86	0.45
3:A:144:ILE:HG13	3:A:149:GLN:HE21	1.82	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:26:DA:H2"	2:C:27:DA:O5'	2.18	0.43
1:B:7:DT:H5"	3:A:142:ARG:HD2	2.01	0.42
3:A:152:ILE:O	3:A:153:SER:C	2.58	0.42
2:C:18:DC:H2'	2:C:19:DT:C6	2.55	0.41
3:A:171:ILE:HD13	3:A:171:ILE:HG21	1.83	0.41
2:C:20:DT:H4'	3:A:186:LYS:HB3	2.03	0.41
1:B:5:DT:H3	2:C:27:DA:H61	1.69	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
3	A	50/52 (96%)	35 (70%)	10 (20%)	5 (10%)	0 0

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	A	146	LYS
3	A	182	ALA
3	A	187	LYS
3	A	181	PRO
3	A	184	SER

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
3	A	45/45 (100%)	37 (82%)	8 (18%)	2 1

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	A	142	ARG
3	A	144	ILE
3	A	145	ASN
3	A	146	LYS
3	A	167	ILE
3	A	186	LYS
3	A	187	LYS
3	A	189	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
3	A	149	GLN
3	A	160	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	B	14/14 (100%)	-0.42	0 100 100	35, 46, 60, 62	0
2	C	13/13 (100%)	-0.49	0 100 100	34, 42, 50, 54	0
3	A	52/52 (100%)	1.64	12 (23%) 0 1	30, 61, 73, 75	0
All	All	79/79 (100%)	0.92	12 (15%) 2 3	30, 55, 73, 75	0

All (12) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	A	184	SER	11.9
3	A	185	ILE	11.8
3	A	183	SER	10.8
3	A	190	ASN	10.6
3	A	189	MET	8.2
3	A	187	LYS	4.2
3	A	188	ARG	4.2
3	A	186	LYS	3.6
3	A	155	LEU	3.1
3	A	139	GLY	2.9
3	A	169	PHE	2.3
3	A	180	PHE	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates

There are no monosaccharides in this entry.

6.4 Ligands

There are no ligands in this entry.

6.5 Other polymers

There are no such residues in this entry.